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YOUNG & THOMPSON			EXAMINER	
745 SOUTH 23RD STREET			LOGIE, MICHAEL J	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/519,552	CACHONCINLLE ET AL.	
	<b>Examiner</b> Michael J. Logie	<b>Art Unit</b> 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 20-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) 34 is/are allowed.
- 6) Claim(s) 20-33 and 35-38 is/are rejected.
- 7) Claim(s) \_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)  
 Paper No(s)/Mail Date 12/28/2004.
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date: \_\_\_\_.
- 5) Notice of Informal Patent Application
- 6) Other: \_\_\_\_.

**DETAILED ACTION**

***Allowable Subject Matter***

Claim 34 is allowed. The following is an examiner's statement of reasons for the allowance:

In regards to claim 34, prior art fails to disclose radiation source according to claim 30, characterized in that a plurality of charge storage capacitors are provided, the cathode comprises an annular portion which is connected to a central portion which is connected to the discharge space, and the charge storage capacitors are distributed around the central portion and are connected, by means of the first terminal thereof, to the annular portion and, by means of the second terminal thereof, to a conductor ring which is electrically connected to the first terminal of the at least one commutation capacitor.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 20, 21 and 27-29 rejected under 35 U.S.C. 102(b) as being anticipated by Ito et al. (US patent no. 5,935,374).

In regards to claim 20, Ito et al. teach a radiation source (fig. 2, 100) comprising: an anode (fig. 2, 4), a cathode (fig. 2, 2), a space for electrical discharge between the

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anode and the cathode (fig. 2, area between 2a and 4a), a pipe (fig. 2, 1) for introducing gas into the discharge space, the gas inlet pipe (fig. 2, 1a) being electrically connected to the cathode (col. 7, lines 34-36), means for producing, in the gas provided in the discharge space (col. 7, lines 45-50), an electrical discharge which brings about the emission of the radiation towards the outside (fig. 2, 3), characterized in that the gas inlet pipe is supplied with gas by a gas supply line (col. 7, lines 34-44) which is arranged for forming, between the portion thereof which is connected to the gas inlet pipe and another portion thereof which is connected to a fixed potential, such an electrical impedance that the production of electrical discharges at the inside the gas inlet pipe is inhibited (fig. 2, 14, L,  $L_F$ ,  $C_F$ ).

In regards to claim 21, Ito et al. teach a radiation source according to claim 20, characterized in that the fixed potential and the anode are earthed (fig. 2, ground symbol before 14 and fig. 1, "anode electrode") and the gas inlet pipe is electrically connected to the cathode (col. 7, lines 34-36).

In regards to claim 27, Ito et al. teach a radiation source according to claim 20, characterized in that the electrical impedance formed by the gas supply line comprises an electrical inductance (fig. 2,  $L_F$ ).

In regards to claim 28, Ito et al. teach a radiation source according to claim 27, characterized in that the gas supply line comprises, between the portion thereof connected to the fixed potential and the portion thereof connected to the gas inlet pipe, an electrically conductive material and is wound in order to form the inductance (fig. 4, 11).

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In regards to claim 29, Ito et al. teach a radiation source according to claim 28, characterized in that the gas supply line is wound against (fig. 4, 11) and with spacing from an electrically insulating assembly component of the source (fig. 4, 10).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 22-26 and 35, 36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. (US patent no. 5,935,374) and further in view of Ahmad et al. (US pgPub 2003/0068012).

In regards to claim 22, Ito et al. differ from the claimed invention by not disclosing characterized in that it further comprises a system for cooling the anode.

Ahmad et al. teach characterized in that it further comprises a system for cooling the anode (fig. 2, 24).

Since Ito et al. and Ahmad et al. teach a radiation source, it would be obvious to one of ordinary skill in the art to combine a system for cooling the anode of Ahmad et al. in the device of Ito et al. because it would increase heat transfer from the anode so that the anode does not overheat.

In regards to claim 23, Ito et al. differ from the claimed invention by not disclosing characterized in that the cooling system has a circulation of cooling fluid on the anode.

Ahmad et al. teach characterized in that the cooling system has a circulation of cooling fluid on the anode (fig. 2, 24 is on "Anode").

Since Ito et al. and Ahmad et al. teach a radiation source, it would be obvious to one of ordinary skill in the art to combine a system for cooling the anode of Ahmad et al. in the device of Ito et al. because it would increase heat transfer from the anode so that the anode does not overheat.

In regards to claim 24, Ito et al. differ from the claimed invention by not disclosing characterized in that the cooling fluid comprises water

Ahmad et al. teach characterized in that the cooling fluid comprises water ([0048], lines 11-18).

Since Ito et al. and Ahmad et al. teach a radiation source, it would be obvious to one of ordinary skill in the art to combine a system for cooling the anode of Ahmad et al. in the device of Ito et al. because it would increase heat transfer from the anode so that the anode does not overheat.

In regards to claim 25, Ito differs from the claimed invention by not disclosing characterized in that the cooling fluid comprises air.

Ahmad teaches characterized in that the cooling fluid comprises air (Since Ahmad et al. teach "coolant", it would be obvious that the coolant could be air because this is a well known means to transfer heat from an area).

Since Ito et al. and Ahmad et al. teach a radiation source, it would be obvious to one of ordinary skill in the art to combine a system for cooling the anode of Ahmad et al.

in the device of Ito et al. because it would increase heat transfer from the anode so that the anode does not overheat.

In regards to claim 26, Ito et al. differ from the claimed invention by not disclosing characterized in that the cooling fluid comprises oil.

Ahmad et al. teach characterized in that the cooling fluid comprises oil ([0048], lines 11-18).

Since Ito et al. and Ahmad et al. teach a radiation source, it would be obvious to one of ordinary skill in the art to combine a system for cooling the anode of Ahmad et al. in the device of Ito et al. because it would increase heat transfer from the anode so that the anode does not overheat.

In regards to claim 35, Ito et al. differ from the claimed invention by not disclosing characterized in that the anode comprises a frustoconical hole for the passage of the radiation emitted in the discharge space, the hole being connected, by means of the small base thereof, to the discharge space and by means of the large base thereof, towards the outside in order to allow the radiation emitted in the discharge space to pass towards the outside.

Ahmad et al. teaches characterized in that the anode comprises a frustoconical hole (fig. 2, 32) for the passage of the radiation emitted (fig. 2, 71) in the discharge space (fig. 2, 3), the hole being connected, by means of the small base thereof (fig. 2, 23), to the discharge space (fig. 2, 3) and by means of the large base thereof (fig. 2, 2), towards the outside in order to allow the radiation emitted in the discharge space to pass towards the outside (fig. 2, 72).

Since both Ito et al. and Ahmad et al. teach a radiations source, it would be obvious to one of ordinary skill in the art to combine characterized in that the anode comprises a frustoconical hole for the passage of the radiation emitted in the discharge space, the hole being connected, by means of the small base thereof, to the discharge space and by means of the large base thereof, towards the outside in order to allow the radiation emitted in the discharge space to pass towards the outside of Ahmad et al. in the device of Ito et al. because an efficient means of using pre-ionization and evacuating it from the discharge space between the anode and cathode.

In regards to claim 36, Ito et al. differ from the claimed invention by not teaching characterized in that the anode comprises a central cylindrical hole for the passage of the radiation emitted in the discharge space, the hole being connected to the discharge space in order to allow the radiation emitted in the discharge space to pass towards the outside.

Ahmad et al. teach characterized in that the anode comprises a central cylindrical hole (fig. 2, hole surrounding 22) for the passage of the radiation emitted in the discharge space (fig. 2, 71), the hole being connected to the discharge space (fig. 2, 3) in order to allow the radiation emitted in the discharge space to pass towards the outside (fig. 2, 72).

Since both Ito et al. and Ahmad et al. teach a radiations source, it would be obvious to one of ordinary skill in the art to combine characterized in that the anode comprises a central cylindrical hole for the passage of the radiation emitted in the discharge space, the hole being connected to the discharge space in order to allow the

radiation emitted in the discharge space to pass towards the outside of Ahmad et al. in the device of Ito et al. because an efficient means of using pre-ionization and evacuating it from the discharge space between the anode and cathode.

In regards to claim 38, Ito et al. differ from the claimed invention by not disclosing characterized in that the cathode comprises a central cylindrical hole for the passage of gas, which hole is connected, at one side, to the discharge space and, at the other side, to the gas inlet pipe.

Ahmad et al. teach characterized in that the cathode comprises a central cylindrical hole (fig. 2, 12) for the passage of gas, which hole is connected, at one side, to the discharge space and, at the other side, to the gas inlet pipe ([0044], lines 1-22).

Since both Ito et al. and Ahmad et al. teach a radiations source, it would be obvious to one of ordinary skill in the art to combine characterized in that the cathode comprises a central cylindrical hole for the passage of gas, which hole is connected, at one side, to the discharge space and, at the other side, to the gas inlet pipe of Ahmad et al. in the device of Ito et al. because an efficient means of using pre-ionization and evacuating it from the discharge space between the anode and cathode.

Claims 30-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. (US patent no. 5,935,374) and further in view of Borisov et al. (WO 02/07484).

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In regards to claim 30, Ito et al. teach the radiation source according to claim 20, characterized in that the means for producing discharge in the discharge space comprise at least one charge storage capacitor (fig. 2,  $C_F$ ).

Ito et al. differ from the claimed invention by not disclosing at least one charge storage capacitor which is electrically connected, by means of a first terminal, to the cathode and, by means of a second terminal, to a first terminal of at least one commutation capacitor which is electrically connected to the anode by means of the second terminal thereof, electrical commutation means being provided between the first and second terminals of the at least one commutation capacitor and a source of charge voltage being provided between the first and second terminals of the at least one commutation capacitor.

Borisov et al. teach at least one charge storage capacitor which is electrically connected, by means of a first terminal, to the cathode and, by means of a second terminal, to a first terminal of at least one commutation capacitor which is electrically connected to the anode by means of the second terminal thereof, electrical commutation means being provided between the first and second terminals of the at least one commutation capacitor and a source of charge voltage being provided between the first and second terminals of the at least one commutation capacitor (pg. 5, Detailed description of the preferred embodiment, lines 1-13).

Since both Ito et al. and Borisov et al. teach a radiation source, it would be obvious to one of ordinary skill in the art to have the at least one charge storage capacitor which is electrically connected, by means of a first terminal, to the cathode

and, by means of a second terminal, to a first terminal of at least one commutation capacitor which is electrically connected to the anode by means of the second terminal thereof, electrical commutation means being provided between the first and second terminals of the at least one commutation capacitor and a source of charge voltage being provided between the first and second terminals of the at least one commutation capacitor of Borisov et al. in the device of Ito et al. because it provides an efficient means of using pre-ionization and evacuating it from the discharge space between the anode and cathode.

In regards to claim 31, Ito et al. differ from the claimed invention by not teaching characterized in that the commutation means comprise a switch, which is controlled in single-pulse mode.

Borisov et al. teach characterized in that the commutation means comprise a switch, which is controlled in single-pulse mode (pg. 7, lines 11-23).

Since both Ito et al. and Borisov et al. teach a radiation source, it would be obvious to one of ordinary skill in the art to have characterized in that the commutation means comprise a switch, which is controlled in single-pulse mode of Borisov et al. in the device of Ito et al. because it provides an efficient means of using pre-ionization and evacuating it from the discharge space between the anode and cathode.

In regards to claim 32, Ito et al. differ from the claimed invention by not disclosing characterized in that the commutation means comprise a switch which is controlled in pulse mode at a repetition frequency less than or equal to 10kHz.

Borisov et al. teach characterized in that the commutation means comprise a switch which is controlled in pulse mode at a repetition frequency less than or equal to 10kHz (pg. 7, 11-23).

Since both Ito et al. and Borisov et al. teach a radiation source, it would be obvious to one of ordinary skill in the art to have characterized in that the commutation means comprise a switch which is controlled in pulse mode at a repetition frequency less than or equal to 10kHz of Borisov et al. in the device of Ito et al. because it provides an efficient means of using pre-ionization and evacuating it from the discharge space between the anode and cathode.

In regards to claim 33, Ito et al. differ from the claimed invention by not disclosing characterized in that the source of charge voltage and the commutation means are such that the at least one charge storage capacitor is charged by the source of charge voltage shortly before the commutation of the commutation means.

Borisov et al. teach characterized in that the source of charge voltage and the commutation means are such that the at least one charge storage capacitor is charged by the source of charge voltage shortly before the commutation of the commutation means (pg. 5, Detailed description of the preferred embodiment, lines 1-13).

Since both Ito et al. and Borisov et al. teach a radiation source, it would be obvious to one of ordinary skill in the art to have characterized in that the source of charge voltage and the commutation means are such that the at least one charge storage capacitor is charged by the source of charge voltage shortly before the commutation of the commutation means of Borisov et al. in the device of Ito et al.

because it provides an efficient means of using pre-ionization and evacuating it from the discharge space between the anode and cathode.

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. (US patent no. 5,935,374) and further in view of Koshelev et al. (EP 1170982).

In regards to claim 37, Ito et al. differ from the claimed invention by not disclosing characterized in that the cathode comprises a central frustoconical hole for the passage of gas, the small base of which is connected to the discharge space and the large base of which is connected to the gas inlet pipe.

Koshelev et al. teach characterized in that the cathode comprises a central frustoconical hole (fig. 3, 63) for the passage of gas, the small base of which is connected to the discharge space and the large base of which is connected to the gas inlet pipe (col. 11, lines 28-41).

Since both Ito et al. and Koshelev et al. teach a radiations source, it would be obvious to one of ordinary skill in the art to combine characterized in that the cathode comprises a central frustoconical hole for the passage of gas, the small base of which is connected to the discharge space and the large base of which is connected to the gas inlet pipe of Ahmad et al. in the device of Ito et al. because an efficient means of using pre-ionization and evacuating it from the discharge space between the anode and cathode.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Logie whose telephone number is 571-270-1616. The examiner can normally be reached on 7:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ml

*Michael Logie*

*[Signature]*  
ROBERT KIM  
SUPERVISORY PATENT EXAMINER

07/25/2007